Stray Creek Forested Vegetation Effects

12/04/2019

This document was updated to clarify existing conditions and the Silvicultural treatment proposal based on comments received during the Scoping period, and to provide more in-depth information on the effects to forested vegetation.

Relevant Laws, Regulations, and Policy

Regulatory Framework

Forest Plan

The Clearwater National Forest Plan provides goals and objectives for the management of the Forest resource. Specific Forest Plan goals and objectives that apply to vegetation management in the Stray Creek area are:

- Provide a sustained yield of resource outputs that will help support the economic structure of local communities and provide for regional and national needs
- Provide and maintain a diversity and quality of habitat to support viable populations of native and desirable non-native wildlife species
- Protect resource values through the practice of integrated pest management

Management Areas

Forest Plan Management Areas (MAs) are designations to distinguish differing management emphases between geographic areas, and contain general guidelines, goals, and standards for the management of forest vegetation within these areas. Management Areas and their goals and standards are set in the Clearwater Forest Plan.

The entire analysis area lies within MA E1, which is Timber.

Federal Law & Regulations and Forest Service Policies & Guidelines

National Forest Management Act (NFMA)

The National Forest Management Act of 1976 (NFMA) contains guidelines for timber management and silvicultural prescriptions, which are listed below.

Timber harvest will occur only where: (NFMA, Section 6: parts E and F)

(i) soil, slope, or other watershed conditions will not be irreversibly damaged;
(ii) there is assurance that such lands can be adequately restocked within five years after harvest;
(iii) protection is provided for streams, stream-banks, shorelines, lakes, wetlands, and other bodies of water from detrimental change s in water temperatures, blockages of water courses, and deposits of sediment, where harvests are likely to seriously and adversely affect water conditions or fish habitat; and
(iv) the harvesting system to be used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber.

Where regeneration harvests are planned:

(i) for clearcutting, it is determined to be the optimum method, and for other such cuts it is determined to be appropriate, to meet the objectives and requirements of the relevant land management plan;

(ii) the interdisciplinary review as determined by the Secretary has been completed, and the potential, environmental, biological, aesthetic, engineering, and economic impacts on each advertised sale area have been assessed, as well as the consistency of the sale with the multiple use of the general area;

(iii) cut blocks, patches, or strips are shaped and blended to the extent practicable with the natural terrain;

(iv) there are, established according to geographic areas, forest types, or other suitable classifications, the maximum size limits for areas to be cut in one harvest operation, including provision to exceed the established limits after appropriate public notice and review by the responsible Forest Service officer one level above the Forest Service officer who normally would approve the harvest proposal: Provided, That such limits shall not apply to the size of areas harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm; and

(v) such cuts are carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, and aesthetic resources, and the regeneration of the timber resource.

When timber is to be harvested using an even-aged management system, a determination that the system is appropriate to meet the objectives and requirements of the Forest Plan must be made, and, where clearcutting is used, it must be determined to be the optimum method (16 U.S.C. 1604(g)(3)(F)(i)).

Knutson-Vandenberg Act

Knutson-Vandenberg Act of 1930 (46 Stat. 527, as amended; 16 U.S.C. 576 - 576b) authorizes the Secretary of Agriculture to "...establish forest tree nurseries and do all other things needful in preparation for planting on national forests..." and requires the "purchaser of national forest timber to make deposits of money ...to cover the cost ...of planting, sowing with tree seeds, cutting, destroying, or otherwise removing undesirable trees or other growth and protecting and improving the future productivity of renewable resources..."

Multiple-Use Sustained-Yield Act

Multiple-Use Sustained-Yield Act of 1960 (Pub. L. 86-517, 74 Stat. 215; 16 U.S.C. 528-531) authorizes and directs the Secretary of Agriculture "...to develop and administer the renewable surface resources of the national forests for multiple use and sustained yield of the several products and services obtained therefrom..."

Forest Service Manual (FSM)

FSM 2020 provides foundational policy for using ecological *restoration*[1] to manage NFS lands in a *sustainable*[2] manner. The aim is to reestablish and retain ecological *resilience*[3] of NFS lands and associated resources to achieve sustainable management and provide a broad range of *ecosystem services*[4]. Healthy, resilient landscapes would have greater capacity to survive natural disturbances and

[1] The process of assisting the recovery of resilience and adaptive capacity of ecosystems that have been degraded, damaged, or destroyed. Restoration focuses on establishing the composition, structure, pattern, and ecological processes necessary to make terrestrial and aquatic ecosystems sustainable, resilient, and healthy under current and future conditions (FSM 2020.5).

[2] Meeting needs of the present generation without compromising the ability of future generation to meet their needs (FSM 2020.5) Sustainability is composed of desirable social, economic, and ecological condition or trends interacting at varying spatial and temporal scales, embodying the principles of multiple-use and sustained-yield (FSM 1905).

[3] The capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks (FSM 2020.5).

[4] Benefits people obtain from ecosystems (FSM 2020.5).

large-scale threats to sustainability, especially under changing and uncertain future environmental conditions, such as those driven by climate change and increasing human uses (FSM 2020.20).

FSM 2470 provides broad policy guidance for silvicultural practices on the national and regional levels (U.S. Department of Agriculture, 2002). Sections pertinent to the Stray Creek proposal include harvesting, reforestation, stand improvement, sale area improvement deposits, examinations, prescriptions, and evaluations. Regional supplements include reforestation and timber stand improvement policies.

Silvicultural Practices Handbook

FSH 2409.17 provides more detail than the manuals for its specific area of concern (USDA, n.d.). This handbook also contains reference information related to reforestation, seed, and Knutson-Vandenburg Fund management. Regional supplements provide additional, specific guidance.

Other Guidance or Recommendations: Openings Larger Than 40 Acres

Direction in Forest Service Manual 2470, Region 1 Supplement #R1 2400-2016-1, Section 2471.1 states that the size of openings created by even-aged silvicultural treatments in the Northern Rockies will normally be 40 acres or less, with certain exceptions. This project is requesting 1 large treatment area of 398 acres that will result in various opening sizes across the entire project, some of which may exceed 40 acres. Openings that exceed 40 acres will be in areas where the extent of root disease is such that treating a lesser area will not address the overall root disease within the stands.

Existing Conditions

Existing Vegetation

The Stray Creek Project Area stands are predominately grand fir or grand fir/Douglas-fir mix (table 1), 45% of which has a DBH that is greater than or equal to 15 inches (table 2). Habitat types are grouped in the Warm Moist Potential Vegetation Type (PVT), which include western redcedar and grand fir habitat types (Milburn et al 2015). Approximately 33% of the project area is in the 10-14.9" diameter range (according to the Region 1 Vegetation Map—field observations were that trees were on the larger end of this size class). Crown ratios within the stands ranged from 30% or less in the smaller diameter size class and 30-45% in the larger diameter size class.

In the mid-size classes, there is little-to-no understory, except where gaps in the canopy exist due to windthrown trees or patches of dead trees. Forbs include queen's cup beadlily, western goldenthread, wild ginger and others. In the larger size class, the understory is more varied due to more gaps in the canopy and wider spacing between the trees. Various forbs, grasses and shrubs were observed, including snowberry and the aforementioned forbs.

Insects and Disease

Approximately 80% of the proposed treatment unit is infected with moderate-to-severe root disease. Field visits found evidence including conks of known root diseases, butt swelling, uprooted trees with exposed roots showing signs of rot, and pockets of mortality showing signs of infection. Both grand fir and Douglas-fir are highly susceptible to root disease and any regeneration within canopy gaps created by windthrown trees or recently-killed snags will continue to perpetuate the disease. If susceptible species are allowed to persist on-site, it can lead to a reduction in forested acres over time (Hagle et al. 2016, Hagle et al. 2000, Shantz 2015).

Some fir engraver galleries were found in standing dead trees within the project area, along with a few signs of recent ambrosia beetle activity. Bark beetles are often found in areas with root disease, and can be a secondary cause of mortality within infected stands (James et al. 1984).

Table 1. Species composition across Stray Creek Project Area from R1 VMap.

Species	Acres	Percent of Project Area
Grand fir /grand fir mix	586	70%
Shade-tolerant mix	146	17%
Ponderosa pine	77	9%
Western redcedar	29	4%

Table 2. Tree size across the project area from R1 VMap.

Size Class (DBH)	% of Project Area
5-9.9"	20%
10-14.9 "	33%
15-20"	45%

Figure 1. Uprooted trees and trees snapped off at the base from root disease.

Figure 2. Schweinizzi root and butt rot conk found growing next to a Douglas-fir within the Stray Creek treatment unit.

Proposed Action

Refer to the Proposed Action in the Stray Creek Environmental Assessment for a detailed description of the Proposed Action.

Direct and Indirect Effects for Proposed Action and No Action

Direct environmental effects are those occurring at the same time and place as the initial activity or action. Indirect effects are those that occur later in time or are spatially-removed from the activity, but would occur in the foreseeable future.

The proposed action would have direct effects on trees species composition and root disease spread within the treatment unit. Reducing the amount of susceptible species can reduce the pathogen activity within a stand by reducing the amount of available hosts (Byler and Hagle, 2000). Indirect effects would include increased resilience of forested stands to insect and disease outbreaks (Table 3). This meets the purpose and need for the project by reducing susceptible trees species across the treatment area and implementing recommended management practices in root-disease-infected stands (Table 4).

Desired conditions in the Warm Moist PVT group is to have an increase in western white pine, western larch and ponderosa pine across the landscape, and a decrease in grand fir and Douglas fir dominance. Pines and larch are considered early seral species in grand fir and western redcedar habitat types. Patch sizes within this group should vary in extent based on fire history and topographical features (Probert 2017). This is also consistent with Forest Plan direction to "perpetuate western white pine" (USDA 1987 pg II-25). The proposed action would meet these desired conditions by reduced grand fir/Douglas fir dominance across the project area while still retaining some in riparian areas, non-harvestable areas and retention for wildlife and other resources.

Table 3. Direct and Indirect Effects for the Proposed Action were analyzed for regeneration harvest across the 398-acre treatment unit.

Resource Element	Resource Indicator	Measure	Proposed Action Direct/Indirect Effects
Forest Cover Type	Tree Species	Acres of change in species composition (i.e. change from shade-tolerant to shade-intolerant)	-Acres of shade-tolerant, late-seral species reduced (grand fir, Douglas-fir) across the 398-acre treatment unit - Acres of early-seral species increased (pines and larch) across the 398-ac treatment unit (through planting and/or retention of early seral species)
Forest Health	Disease	Acres of disease susceptible species	- Increased disease resistance across 398 acres by decreasing susceptible species

Table 4. Table showing how the proposed action meets the purpose and need.

Purpose and Need	Indicator/Measure	Proposed Action
Restore species composition to early seral, shade-intolerant species	Acres of change in species composition (i.e. change from shade-tolerant to shade-intolerant)	398 acres returned to early seral mixed conifer stands (stand reinitiation stage) with pines and larch making up the majority of the species and western redcedar, Douglas-fir and grand fir being minor components
Reduce amount of disease susceptible and disease-infected trees	-Acres of susceptible species	-Reduce overall amounts of late seral species that are susceptible to root disease across the 398-acre treatment area

No Action would result in no new or additional vegetation management activities occurring within the project area. Species composition would remain late-seral, root disease susceptible species that would continue to lose volume and increase pathogen levels within the stand. Over time, larger trees would continue to succumb to root disease before reaching desired age and size class for old growth, leading to an overall loss of large trees on the landscape (Byler and Hagle, 2000; Lockmen and Kerns, 2016). Regeneration of susceptible species will eventually lead to loss of site production as the cycle repeats to the point that young trees are killed before they reach merchantability (Hagle 2004). Environmental consequences of the no action alternative are summarized in Table 5.

Table 5. Summary of environmental effects to vegetation resources with regeneration harvest on the 398-acre treatment unit.

Resource Element	Indicator	No Action	Proposed Action
Forest Cover Type	Tree Species	-Late-seral species dominating canopy and understory in 398-ac treatment area -early-seral species continues to decrease across the 398 acre-treatment area	-Percentage of shade-tolerant species reduced across 398 acres - Percentage of early-seral species increased across 398 acres
Forest Health	Disease	-low tree vigor and volume production -Increase in root disease extent -continued mortality of shade-tolerant regeneration due to root disease infection, reducing overall timber volume production in the project area	-Individual tree vigor promoted - Disease resilience and resistance increased across the 398-acre treatment unit -Maintained or increased volume production

Cumulative Effects

Past, Present, and Reasonably Foreseeable Activities Relevant to Cumulative Effects Analysis

Cumulative effects result from incremental effects of actions, when added to other past, present, and reasonably-foreseeable future actions, regardless of the agency or person that undertakes such actions. The Stray Creek treatment unit is the cumulative effects analysis area.

Past activities within the analysis area that have effected forest cover types and forest health include timber harvest, wildfires, and fire suppression. The tree species that resulted from past harvest is part of the existing conditions discussed above in Direct and Indirect Effects.

There are no present or reasonably foreseeable future vegetation treatments identified within the treatment area, other than those being proposed by the Stray Creek Project. The effects of the proposed action are discussed in the previous section, and that, when combined with the environmental effects for each Resource indicator, shows the cumulative effects.

Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Forest Plan

Timber

- Silvicultural prescriptions will be site-specific and will be designed to maintain stocking control density commensurate with level of management intensity
- Old growth stands within the project area are being managed for snag and old-growth dependent species.

Old Growth

No old growth is being proposed for harvest; therefore there will be no change in acres managed for old growth within the Old Growth Unit (OGU) that contains the project area. OGU 107 currently has 10% existing old growth and 21% step-down, which is well above the forest plan standard of 5% old growth within each OGU (Table 6).

Table 6. Table showing acres managed for old growth within OGU 107.

Status	Acres	% of OGU
Retained existing old growth	816	10%
Step-down old growth	1,768	21%
Totals	**2,585**	**30%**

Management Area

The Stray Creek project proposal is consistent with MA goals and standards outlined by the Clearwater National Forest Plan. Areas identified as treatment areas will comply with the appropriate MA guidance (see table 7).

Table 7. Management Area goals and standards for the Stray Creek Project Area.

Management Area Goals	Timber Standards
E1—provide optimum, sustain production of wood products. Timber production is to be cost effective and provide adequate protection of soil and water quality. Manage viable elk populations within areas of historic elk use based on physiological and ecological needs. Maintain a range of water quality and fish habitat potential from high fishable in several of the key anadromous and resident fish streams to a low fishable in the Palouse District and portions of the Pierce District.	- Schedule timber harvest using logging and silvicultural methods appropriate for the stand and the terrain. - Maintain stocking control commensurate with the level of management intensity. - Identify and maintain suitable old-growth stands and replacement habitats for snag and old-growth dependent wildlife species

National Forest Management Act

The Stray Creek project has been reviewed, and is in compliance with all silvicultural requirements in NFMA.

The Stray Creek project would be in compliance with the requirement in NFMA that regeneration harvest areas will be adequately restocked within five years after harvest. Past reforestation practices in the project area have proven to be successful on a wide variety of sites using a variety of silvicultural systems. This past regeneration success provides a good assurance of successful restocking within five years for this project. All harvest and planting treatments are followed up with reforestation stocking surveys after treatment, to ensure adequate restocking is achieved.

According to NFMA, when timber is to be harvested using an even-aged management system, a determination that the system is appropriate to meet the objectives and requirements of the Forest Plan must be made, and, where clearcutting is used, it must be determined to be the optimum method. All even-aged management proposed in the Stray Creek project is appropriate to meet the objectives and requirements of the Forest Plan. Silvicultural prescriptions will be written during implementation, and will address site-specific needs in the stand.

Forest Service Manual

The Stray Creek project has been reviewed, and is in compliance with the guidance issued for silvicultural systems in the Forest Service manual.

When timber production is emphasized in forest plans, the Forest Service Manual states that silvicultural practices will ensure that stands achieve and maintain the level of stocking, species composition, and structure best-suited to meeting short- and long-term management objectives, including those addressing volume growth and yield.

When other resources are emphasized along with timber production, it is important that stocking, species composition, and stand structure are identified to meet short- and long-term resource management objectives and be implementable and sustainable considering concepts of disturbance and forest ecology. Modification of desired stand composition and structure conditions should be done to compliment landscape-level desired composition, structure, and function objectives.

Openings over 40 acres

Direction in Forest Service Manual 2470, Region 1 Supplement #R1 2400-2016-1, Section 2471.1 states that the size of openings created by even-aged silvicultural treatments in the Northern Rockies will normally be 40 acres or less, with certain exceptions. The request to exceed 40-acre openings documentation will be available in the project record prior to a final decision notice once the public has been notified and the Regional Forester has approved the request.

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